

LAKE SHORE INC.
An Oldenburg Group Company
KINGSFORD, MICHIGAN

SHEET 1 OF 24
DATE January 15, 1996
REVISED _____

TP-1073-AR-041

MODULAR CAUSEWAY FERRY
MODULE LOCK INSTALLATION INSPECTION
TEST PROCEDURE

TP-1073-AR-041

PRELIMINARY

CUSTOMER ATCOM

CUSTOMER JOB NO. N/A

CUSTOMER P.O. NO. DAAK01-93-D0007

HULL NOS. _____

EQUIPMENT Modular Causeway Ferry

EQUIPMENT NO. _____

EQUIPMENT SERIAL NOS. _____

CUSTOMER NOTIFICATION PRIOR TO TESTING _____

ENGINEERING NOTIFICATION PRIOR TO TESTING _____

LAKE SHORE SALES ORDER NO. 1073AR

DRAWN _____ DATE _____

CHECKED _____ DATE _____

APPROVED _____ DATE _____

QUALITY _____ DATE _____

RETURN TO INDEX

TP-1073-AR-041

SHEET 2 OF 24
DATE January 15, 1996
REVISED _____

Rev	Date	Appvl	Q.A.	Description
--	1/15/96	WJK		Initial Issue

PRELIMINARY

TP-1073-AR-041

**MODULAR CAUSEWAY FERRY
MODULE LOCK INSTALLATION INSPECTION
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PRELIMINARY

1.0 GENERAL

This procedure is written to outline the necessary steps to be taken at Fort Eustis, Virginia (FEVA) to inspect each of the LSI delivered Modular Causeway System (MCS) modules and provide information to establish corrective action for deficiencies found.

The inspection intended for this procedure is the location and geometry of the module to module connection castings, male and female, and the locations of the ISO corner castings with regard to longitudinal and transverse planes. It is specifically NOT intended to include any modifications or inspection of the MCS/Navy N/L shear or flexor connection fittings (i.e., section to section flexible connections).

2.0 REFERENCES

The following drawings are part of this procedure:

- 2.1 LSI Drawing E25932, "Corner Gage, Transverse".
- 2.2 LSI Drawing E25952, "Corner Gage, Longitudinal".
- 2.3 LSI Drawing E02863, "Construction Tolerances and Molded Dimensions".
- 2.4 LSI Drawing E26284, "20' Module Connector Gaging".
- 2.5 LSI Drawing E26274, "40' Module Connector Gaging".
- 2.6 Test Report 1073-AR-041, "Module Inspection Status Sheet".
- 2.7 LSI Drawing E20011, "Failure Reporting, Analysis and Corrective Actions System".
- 2.8 LSI Drawing E26361, "Gage, Trammel".

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3.0 PROCEDURE

For each module at FEVA the following inspection is to be performed.

- 3.1 End Connection Fittings. The gages of Ref 2.1 and 2.2 are to be applied to the ends of each module to determine that the proper locations of the connection castings and ISO fittings have been maintained.

Dimensions are to be recorded on Ref 2.4 for 20' modules and Ref 2.5 for 40' modules.

- 3.2 Side Connection Locks. The gages of paragraph 2.8 and a 50' tape measure are to be used to determine that the proper locations of the side locking fittings have been maintained.

Dimensions are to be recorded on Ref 2.4 for 20' modules and Ref 2.5 for 40' modules.

4.0 INSPECTION REVIEW

Results of inspections done in Paragraph 3.0 will be reviewed to determine extent of corrective actions and/or repair. Review/repair criteria are as follows:

- 4.1 ISO Corner Fittings. When gaged, there should be a minimum of 4.38" from the back side of the gage bar (item 3 of Ref 2.1 and 2.2) to the face of the ISO fitting, for both the end and side faces. Use 1" key stock between gages if dimension is less than 1" between gages at corner. See paragraph 4.2.
- 4.2 Connector End Fittings, Top and Bottom -- Relationship with the Side Connectors. Top and bottom end connector fittings when properly fitted will allow the gage bars to show a distance of 1.00" between the rectangular bars located on the gage ends. If this distance is greater than 1/16" off, either in an outboard or inboard direction, further survey work will be required on the module's fittings to determine remedial action, if any.
- 4.3 Connector End Fittings, Top and Bottom -- Relative Transverse Positions. The connectors must be 60" +/- 1/16" apart. If this tolerance is exceeded in either direction, additional survey must be taken to determine if one or both connector assemblies are mislocated. Remedial action will be taken when this determination is made.

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- 4.4 Connector End Fittings, Top and Bottom -- Relative Fore/Aft Positions Vertically. If a check of dimensions indicates a mislocation of the top and bottom connector fittings greater than $3/32"$, on either side, further survey must be taken and/or remedial action taken.
- 4.5 Side Connector Fittings -- 20' Raked Modules. Distance between side connector fittings must be $60" \pm 1/16"$. Discrepancies greater than tolerance will be dealt with by determining which fitting is mislocated, followed by remedial action as needed. A survey of the specific mislocation will determine the correct approach.
- 4.6 Side Connector Fittings -- 40' Modules. Distance between side connector fittings must be $60" \pm 1/16"$. Discrepancies greater than tolerance will be dealt with by determining which fitting is mislocated, followed by remedial action as needed. A survey of the specific mislocation will determine the correct approach.
- 4.7 Side Connector and End Connector Trammel Gaging. Diagonal trammel readings if greater than $1/16$ variance will result in further detailed survey to determine needed (if any) corrective action. Use trammel gages and punch mark per ref. 2.8.
- 4.8 Vertical Trammel Gaging. Measure vertical distance between trammel punch marks (ref. para. 4.7), if relative lengths of diagonals exceeds $\pm 1/16$. Additional survey will determine corrective action.

5.0 REPORTING

All data taken shall be recorded on Reference 2.4 and 2.5. Separate sheets for each module inspected shall be used. Overall module lengths, widths and diagonals need not be taken if module is shown to be otherwise in tolerance.

Inspection status to be logged per Section 6.0 of this procedure.

- 5.1 Modules with Discrepancies Out of Tolerance. Dimensions indicated to be out of tolerance shall be recorded on page 3 of reference 2.7, listing those specific locations and actual vs. drawing dimensions. In addition use the appropriate tables of TR-1073-AR-041 to indicate the module has failed by placing an "X" in the "F" column. (See Paragraph 6.0 of this procedure.)

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- 5.2 Modules with No Discrepancies. Modules with no discrepancies shall be indicated with an "X" in the "P" column of the appropriate tables from TR-1073-AR-041, as well as date and location of inspection. (See paragraph 6.0 of this procedure.)

6.0 MODULE INSPECTION STATUS SUMMARY

Using TR-1073-AR-041 a summary of the status of each module inspected will be maintained. Complete the status columns by indicating for each module the date inspected location (i.e., FEVA, ONT, IR, etc.) and an "X" in the appropriate "P" or "F" column.

- 6.1 P40 Modules. Use Table TR-1073-AR-041-1.
- 6.2 P40P Modules. Use Table TR-1073-AR-041-2.
- 6.3 P20RR. Use Table TR-1073-AR-041-3.
- 6.4 P20CR. Use Table TR-1073-AR-041-4.
- 6.5 P20LR. Use Table TR-1073-AR-041-5.
- 6.6 Beach/Sea End Modules. Use Table TR-1073-AR-041-6.

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Table TR-1073-AR-041-1
P40 Module Inspection Status


MODULE S/N	DATE INSPECTED	LOCATION	P	F	CORRECTIVE ACTION COMPLETED	
					BY	DATE
P40- 1						
P40- 2						
P40- 3						
P40- 4						
P40- 5						
P40- 6						
P40- 7						
P40- 8						
P40- 9						
P40- 10						
P40- 11						
P40- 12						
P40- 13						
P40- 14						
P40- 15						
P40- 16						
P40- 17						
P40- 18						
P40- 19						
P40- 20						
P40- 21						
P40- 22						
P40- 23						

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
-	INITIAL ISSUE	10-21-94	UK

FAILURE REPORTING, ANALYSIS, AND CORRECTIVE ACTION SYSTEM (FRACAS)

- In addition to the functional and performance test data required for each test, operational history, maintenance actions, and failures and incidents shall be reported for all tests. In the event of an incident or failure in which the equipment fails to meet the functional or performance requirements specified, the Failure Reporting, Analysis, and Corrective Action System (FRACAS) shall be initiated.
- In the event of an incident or failure, testing shall be stopped. Lake Shore Engineering shall be contacted immediately and prior to performing any corrective action.
- For each incident or failure, a Failure Identification Report shall be completed by test personnel. The Failure Identification Report shall identify the failed equipment, the time of failure, the operating conditions at the time of failure, the symptoms or suspected cause of failure, and the observed affect of the failure. Photographs shall be used to document pertinent information. Upon concurrence or direction from Lake Shore Engineering, the action taken to repair the failure shall be noted.
- For each incident or failure, an analysis of the failure shall be completed by Lake Shore Engineering. The analysis shall determine the mode of failure, root cause, and impact on operation for the failure. The analysis shall determine whether the incident is relevant or non-relevant. The analysis shall result in the appropriate corrective action, either through design changes or operational changes, to prevent reoccurrence of the failure.

				 LAKE SHORE, Inc. <small>IRON MOUNTAIN/KINGSFORD, MICHIGAN 49801</small>			
		DRAWN	JK	10/14/94	TITLE FAILURE REPORTING, ANALYSIS, and CORRECTIVE ACTION SYSTEM		
CHECK	RMS	10/21/94					
APP.	UK	10/21/94					
		SIZE	CODE IDENT. NO.	DRAWING NO.		REV.	
		A	34712	E20011		-	
		SCALE	WT.	LBS.	SHEET	1 of 3	

5. After corrective action has been taken to prevent reoccurrence of the failure, testing shall be performed (as appropriate) to verify the effectiveness of the corrective action, and the test being conducted at the time of failure shall be repeated.

6. Relevant failure - a failure caused by deficient design, manufacturing, software, or (contractor furnished) operating or maintenance instructions.

Non-relevant failure - a failure caused by any influence outside the specified normal operating conditions or configuration of the equipment (installation damage, accident or mishandling, test fixtures or facilities, overstress condition, human errors).

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FAILURE IDENTIFICATION REPORT

Failure Date _____

Failure No. TP- _____ -FI _____

LSI Job No. _____

Customer Contract No. _____

	<u>Name</u>	<u>Part No.</u>	<u>Serial No.</u>
Equipment	_____	_____	_____
Subassembly	_____	_____	_____
Failed Part	_____	_____	_____

1. Test Failed / Paragraph:

2. Total Test Time at Failure: _____ hrs _____ cycles

3. Description of Failure / Symptoms: _____ Photograph Y N

4. Other Equipment Failed or Affected:

5. Repair Action:

Engineering Contact:

6. LSI Test Supervisor: _____

Date _____

Submit to Engineering for Failure Analysis

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